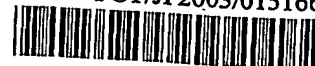


Translation

PATENT COOPERATION TREATY

PCT/JP2003/015166



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FNSK0314PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2003/015166	International filing date (day/month/year) 27 November 2003 (27.11.2003)	Priority date (day/month/year) 28 November 2002 (28.11.2002)
International Patent Classification (IPC) or national classification and IPC H02P 21/00, 7/63		
Applicant NSK LTD.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the report

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 03 June 2004 (03.06.2004)	Date of completion of this report 01 April 2005 (01.04.2005)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

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International application No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☒ The international application as originally filed/furnished
- ☐ the description:
- pages _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____, as originally filed/furnished
- pages* _____, as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims		NO
Inventive step (IS)	Claims	2, 3	YES
	Claims	1, 4-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims		NO

2. Citations and explanations

Document 1: JP 8-294299 A (Matsushita Electric Industrial Co., Ltd.), 5 November 1996, all pages, & US 5701066 A

Document 2: JP 2000-270599 A (Yaskawa Electric Corp.), 29 September 2000, all pages (Family: none)

Document 3: JP 11-55994 A (Yaskawa Electric Corp.), 26 February 1999, all pages (Family: none)

Document 4: JP 9-23699 A (Yamaha Motor Co., Ltd.), 21 January 1997, all pages (Family: none)

Document 1 discloses a motor drive control device wherein a motor current is detected, and current control for a three-phase AC motor is performed using vector control. Further, document 1 also discloses the use of the motor control device in an electrically-powered power steering device.

Document 2 discloses an AC motor control device that performs PI control when controlling current.

Document 3 discloses a brushless DC motor control device for performing control wherein the motor terminal voltage has a square waveform. Further, document 3 also discloses sensorless drive.

Document 4 discloses a permanent magnet synchronous motor control device which performs control in a manner

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characterized in that when performing weak field control in a high-speed range, the field current strength is calculated from the torque and the speed, and at or above a specified speed, the field current is progressively reduced in alignment with the speed, thereby preventing excessive rotation.

Claims 1, 4, and 7 do not involve an inventive step in the light of documents 1 and 2.

Claims 5 and 6 do not involve an inventive step in the light of documents 1 to 3.

Claims 8 to 13 do not involve an inventive step in the light of documents 3 and 4. A person skilled in the art could easily conceive of applying square waveform control such as that disclosed in document 3 to the motor control device for performing weak field control disclosed in document 4.

Claims 14 to 18 do not involve an inventive step in the light of documents 3 and 4. The reduction of harmonic waves is merely a feature fittingly implemented by a person skilled in the art.

Claims 2 and 3 are novel and involve an inventive step. The characterizing features of the invention described in claim 2 are neither disclosed nor suggested in any of the documents, nor would they be obvious to a person skilled in the art.

Claims 1 to 18 are clearly industrially applicable.